

CLIMATOLOGICAL DATA FOR JUNE, 1912.

DISTRICT No. 9, COLORADO VALLEY.

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GENERAL SUMMARY.

For the most part the barometric pressure was low and stagnant during the month. The usual summer thunderstorms attended this condition during the latter part of the first decade, and during the second and third decades they were of frequent occurrence. The precipitation was greater than the June average over most of the district, and a notable feature was the moderately heavy snowfall in the eastern part of the Colorado area about the middle of the month. High winds and sandstorms occurred on various dates in localities in Arizona and New Mexico. Flood conditions obtained in the Colorado and its northern tributaries during the first half of the month. Considerable damage resulted along the Grand and its most important tributary, the Gunnison. Along the Colorado River, between Fort Mojave, Ariz., and Palo Verde, Cal., much damage was done. Warm weather prevailed during the first six days of the month; after the 7th the mean temperature averaged below the normal. At the more elevated stations in Arizona, in localities in northern and central New Mexico, Utah, except the southern portion; Wyoming; and Colorado, except the valley regions, frost or freezing temperature occurred on various dates, more especially between the 16th and 19th, but the damage was immaterial.

TEMPERATURE.

The mean of the 142 stations reporting was 67.9°, or 0.4° below the normal. The mean for June, 1911, was 69.1°. The highest monthly mean was 95.4° at Aztec, Ariz., while the lowest was 38.0° at Corona, Colo. Except in Wyoming and Arizona, the monthly means were below the normal. The small deficiency in the monthly mean temperature for the district as a whole was due chiefly to the warm weather that prevailed during the first week of the month. From the 7th to the close of the month, except in Wyoming, mean temperatures averaged below the normal. In the Colorado area the low temperatures were unusually pronounced from the 15th to the 19th, inclusive. In Wyoming the highest temperatures occurred during the last decade; in the remainder of the district the weather was warmest between the 3d and the 6th. Over most of the Colorado Basin the lowest temperatures obtained between the 15th and 19th.

Details of temperature are summarized in the following table:

Areas of States in District No. 9.	Temperature.					
	Mean.	Departure from normal.	Highest.	Station.	Lowest.	Station.
Western Wyoming...	54.8	+2.3	90	Green River...	20	Willow Creek Cabin.
Western Colorado.....	56.5	-2.0	97	Delta.....	15	Chromo.
Eastern Utah.....	65.5	-0.4	104	Springdale...	18	Strawberry Tunnel (east) and Scofield.
Western New Mexico.	67.8	-1.0	104	At 4 stations.	27	Berger's Ranch.
Arizona.....	76.5	+0.4	120	Gilabend.....	23	Flagstaff No. 1.
Southeastern Nevada.	73.4	112	Logan.....	38	Caliente.

PRECIPITATION.

The average for the 193 stations reporting was 0.93 inch, or 0.27 inch above the normal. The average for June, 1911, was 1.04 inches. There was a deficiency in the Wyoming and the Utah areas, but on all the drainage basins the averages were above the normal. The precipitation was largely in the form of thundershowers. In the Colorado area, however, snow fell near the Continental Divide from the 15th to the 17th, principally on the 17th. But little rain fell during the first week of the month. In Wyoming and Colorado frequent showers occurred after the 7th. In Utah, New Mexico, and Arizona the precipitation was confined chiefly to the 7th and 8th and the last decade. The greatest monthly amount was 5.66 inches at Redcliff, Colo., while none occurred at 1 station each in Utah and New Mexico, and at 5 in Arizona.

The average number of days with 0.01 inch or more precipitation was 5 in western Wyoming; 9 in western Colorado; 4 in eastern Utah; 5 in western New Mexico; 3 in Arizona; and 1 in southeastern Nevada. For the district as a whole the average was 5 days.

The average precipitation and departures from the normal on the different watersheds are given in the following table:

Watershed.											
Green.		Grand.		San Juan.		Little Colorado.		Gila.		Mimbres.	
Average.	Departure.	Average.	Departure.	Average.	Departure.	Average.	Departure.	Average.	Departure.	Average.	Departure.
0.95	+0.06	1.75	+0.68	1.39	+0.30	0.64	+0.14	0.50	+0.22	1.39	+0.28
0.34	+0.14										

MISCELLANEOUS.

There was less than the normal sunshine. At Grand Junction it was 73; Durango, 76; Phoenix, 92; and Yuma, 94 per cent of the possible.

The relative humidity was above the normal for the district. The following are the values: Grand Junction, 36; Durango, 52; Phoenix, 28; and Yuma, 40 per cent.

FLOOD IN THE COLORADO.

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Remarkably high stages prevailed for a short time in June in several of the important tributaries of the Colorado River, and for a somewhat longer period in the trunk stream. This large volume came from the melting of snow, for the most part in the upper reaches of the streams rising in Colorado. The volume contributed by the Green from the more northerly area in Wyoming was relatively small and, fortunately, came after the crest had passed in the more southerly tributaries. The Gunnison, which had reached a very high stage during the warm spell in

the last decade of May, principally owing to the large volume contributed by the North Fork, draining a relatively low mountain region, rose again early in June, but did not reach so high a stage as in May. The warm spell that brought on this second rise began on the first of the month and lasted till the 7th. Its influence extended to the highest levels, causing a rapid melting of snow in the upper reaches of the Gunnison, the Grand, and in the White and Yampa, important tributaries of the Green in Colorado.

While the stages reached in the main tributaries were practically as high as during the freshet three years ago, they were not sustained for so long a time. That stages much out of the ordinary should have occurred is due principally to the long period of cold that kept melting in check until late in the season. In the Gunnison the maximum stage at Sapinero, 19 feet, and at Delta, 11.3 feet, occurred on the 5th, while at Grand Junction 10.5 feet was attained on the following day. In the upper reaches of the tributaries of the Grand the maximum stage at Eagle, on the Eagle, 5.3 feet, occurred on the 6th; at Carbondale, on the Roaring Fork, 6.5 feet, on the 5th. The highest stage on the Grand at New Castle was 14.2 feet, on the 9th and 10th, and at Grand Junction 11.8 feet, during the night of the 9th-10th. At Fruita, however, below the junction of the Grand and Gunnison, the highest stage, 14.4 feet, occurred on the 7th. The previous highest stage at this station was 15 feet, in June, 1909. The Green at Elgin, Utah, reached the maximum stage of the season, 14 feet, on the 9th and 12th. In June, 1909, the year of very high water, the maximum stage at Elgin was 15.1 feet. The maximum stage in the San Juan at Farmington, N. Mex., was 7.9 feet, on the

6th. In the Colorado proper, at Grand Canyon, Ariz., a stage of 64 feet occurred on several days in the beginning of the second decade. At Topock, near Needles, the highest stage was 21.1 feet, on the 16th, and at Yuma, 29 feet, on the 22d. At Hite, Utah, in Glen Canyon, above the San Juan, Mr. Hite states the Colorado on the 13th reached the highest point known at that place. The river was about 10 inches higher than the highest point reached in June, 1884.

Along the tributaries of the Colorado the damage done was principally to bridges, roads, headgates of ditches, and by erosion, and in the aggregate it was considerable. On the trunk stream the damage was widespread owing to the breaking of dikes and the flooding of farm lands, principally on the Arizona side, above Needles. On the morning of the 3d the levee, approximately 20 miles long, protecting about 200,000 acres of land north of Needles, broke, and the entire upper Mojave Valley was put at the mercy of the flood. A conservative estimate places the loss at more than \$175,000. Along the river front at Needles the damage was over \$25,000. Information from Palo Verde, Cal., is to the effect that the entire valley was inundated. The loss in live stock was considerable, but the great loss was to growing crops. Much hay and grain were swept away, and the alfalfa is dead from being under water. Many families lost all, houses included. In the country covered by the Yuma irrigation project the damage to land, crops, and prospective sale value of the land may amount to \$100,000.

Timely and accurate warnings of the high stages were sent localities likely to sustain damage. For the lower reaches of the trunk stream these warnings were issued 10 to 15 days in advance.